CZ3106 Symbolic Computing, Tutorial 3

A/P Wang Jian-Sheng week 17-22 Feb 03

1. What does the following expression do?

(a)

```
{{1,1}, {2,2}, {3,3}} /. {x_, y_} :> {x, 2y}
```

(b)

```
{{1,1}, {2,2}} /. {x_, y_} :> {x, 2y}
```

Note that :> is a rule with delayed evaluation of the right-hand side (similar to `:=`.

2. Explain what the following function `func[]` can accomplish. Give an example to illustrate the use of `func[]`.

```
func[l_] := ff[l, {}];
ff[ {}, r_] := r;
ff[ {h_, t___}, {r___} ] := ff[ {t}, {r, h} ] /; h>0;
ff[ {h_, t___}, {r___} ] := ff[{t}, {r}] /; (h<=0||Head[h]==Symbol)
```

3. What does this program do?

```
runEncode[lst_List] :=
  Map[ {#,1}&, lst] //.
     {u___, {v_,r_}, {v_, s_}, w___} -> {u, {v, r+s}, w}
```

4. How does one read a data file representing a 4 by 4 matrix

```
0.3 -3.0 0.3  1.023
0.1  0.2 1.1  0.003
5.0  2.3 2.3  0.1
0.3  0.1 4.4  0.005
```

into Mathematica as a (Mathematica) matrix (list of list) for further manipulation (such as solving a linear equation)?

Conversely, how does one write a set of data suitable for C or Fortran to read?